

ЛУЧШИЕ ФИНАЛЬНЫЕ ПУБЛИКАЦИИ

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MARCH

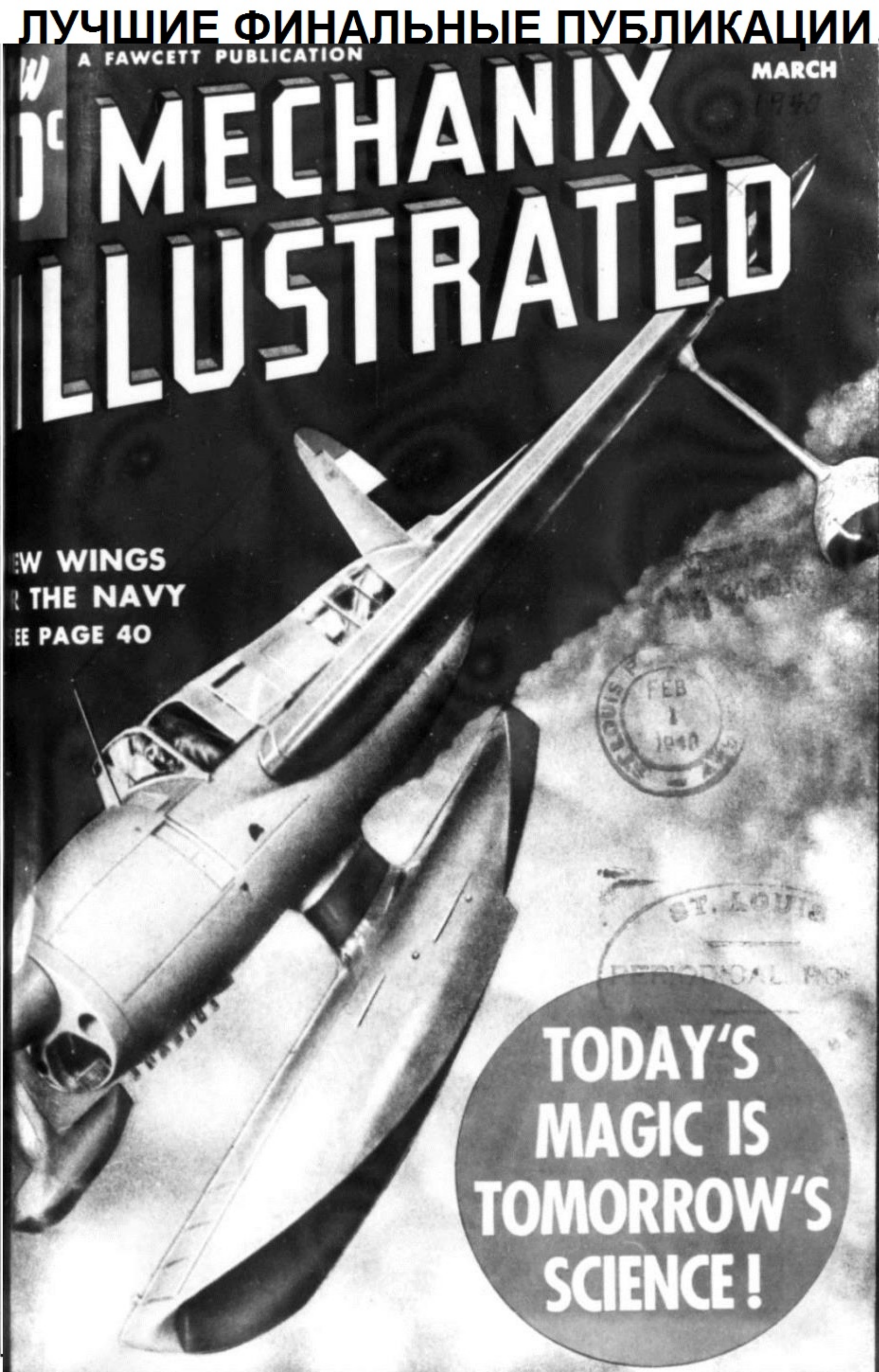
1940

MECHANIX ILLUSTRATED

NEW WINGS
FOR THE NAVY
SEE PAGE 40



**TODAY'S
MAGIC IS
TOMORROW'S
SCIENCE!**



PRICE
10 CENTS

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IN CANADA

MECHANIX ILLUSTRATED

MARCH
1940

Volume XXIII
Number 5

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AVIATION IS booming these days! Plane factories from coast to coast are running on 24-hour schedules, yet the orders still pile up; air lines are booked heavy with passages, with waiting lists hoping for cancelled reservations; aviation has started on its greatest boom!

What could be more timely than the next two articles of MI's YOUR JOB series—both of them on aviation?

The first article, in the next issue, covers flying itself, in all its phases. The following article, in the May issue, will take up the jobs of those men who stay on the ground, yet who are vital to aviation.

With a crying need for skilled men, men who are specialists in some phase of flying, these are two articles that no young man in America can afford to miss!

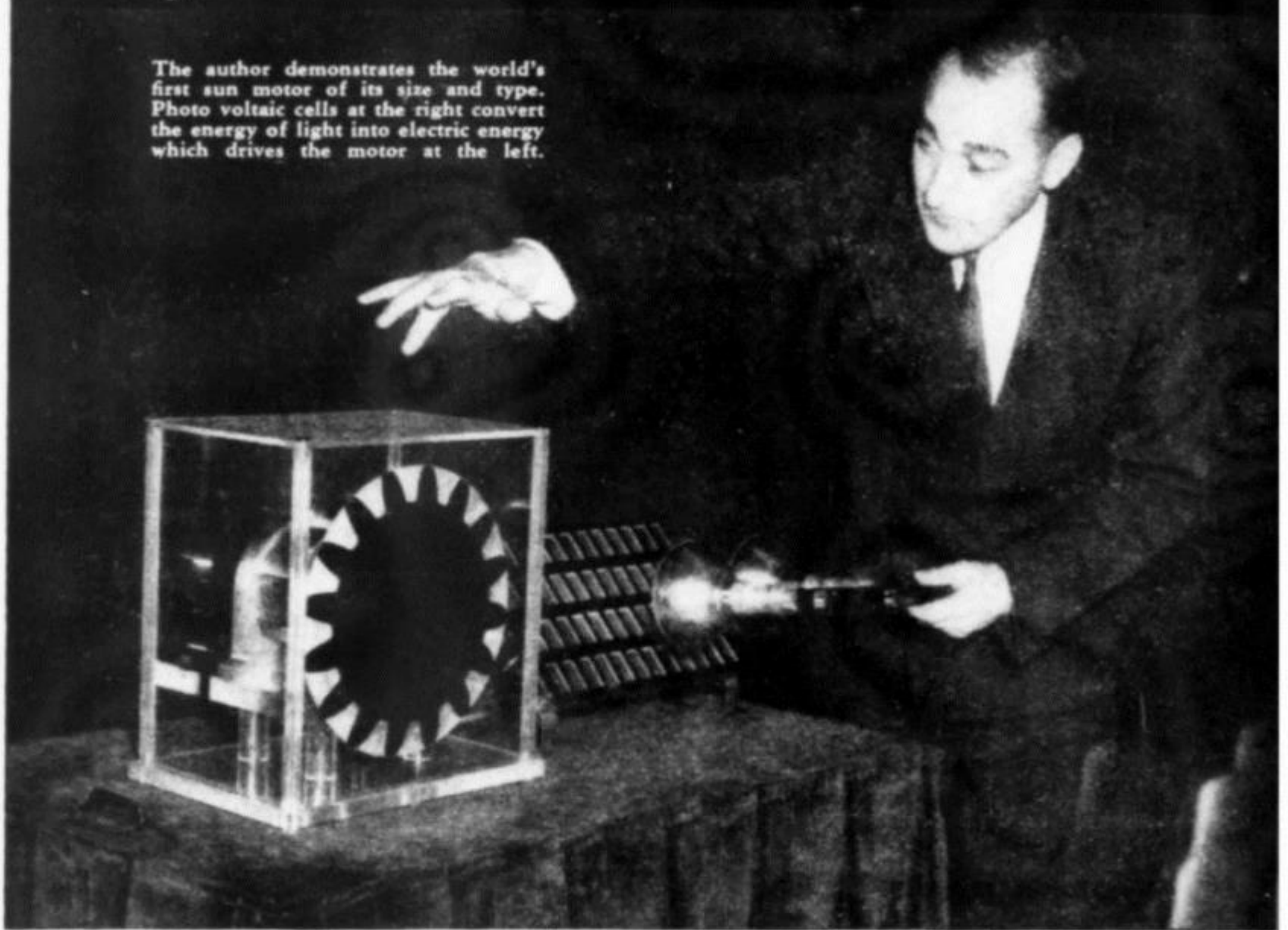
The new MECHANIX ILLUSTRATED is on sale at all newsstands the first of every month.

Published monthly by Fawcett Publications, Inc., 11th Street and Broadway, Louisville, Kentucky. Executive Office—22 W. Putnam Avenue, Greenwich, Connecticut. Editorial and Advertising offices—1501 Broadway, New York, New York. Send subscriptions to the Louisville, Kentucky, or Greenwich, Connecticut, addresses.

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H. FAWCETT, Publisher RALPH DAIGH, Managing Editor ROBERT HERTZBERG, Editor AL ALLARD, Art Director
CLIFF TAYLOR, STANLEY GERSTIN, ROLAND CUEVA, Associate Editors S. S. RABL, Naval Consultant

The author demonstrates the world's first sun motor of its size and type. Photo voltaic cells at the right convert the energy of light into electric energy which drives the motor at the left.



Today's Magic is Tomorrow's Science

by William A. Gluesing

*Director of the General Electric "House of Magic"
at the New York World's Fair*

WHEN the people who have seen the General Electric "House of Magic" at the New York World's Fair ask us why we do not build them a sun motor to run their automobile, our usual joking answer is: "What would you do when the sun goes down?"

The scientists of the research laboratory who are responsible for these new developments never make predictions, even though

it sometimes seems that that is what everyone expects them to do. Speaking as an individual and without any pretense to the role of scientist, I am usually willing to let my imagination run into the future after first exacting a promise that no one will come back to me 200 years from now and say you told me "so and so" and it hasn't materialized.

As a rambler of the Jules Verne variety, then, I can tell you what some of the things

CURRENT GENERATED BY CELLS IS COLLECTED AND DISTRIBUTED THROUGH FREQUENT DIVISION STORAGE STATIONS

IT IS ESTIMATED BY SCIENTISTS THAT SOLAR RADIATION CAN DEVELOP OVER 100,000 HORSEPOWER PER SQUARE MILE OF VOLTAIC CELLS

THIN COPPER FILM

SOLID COPPER ANODE WITH OXIDIZED TOP

SECTION THRU VOLTAIC CELL

ELECTRICALLY CONTROLLED SLIDING GLASS SUN ROOF

VENTILATING REGISTERS

FLEXIBLE OVERHEAD COLLECTOR ARM FOR SECONDARY CIRCUIT

AIR CONDITIONING AND HEATING UNIT

ENERGIZED RAILS

RADIO PHONE

STORAGE BATTERIES UNDER FLOOR PROVIDE POWER FOR SHORT TRIPS AWAY FROM ENERGIZED HIGHWAYS

BUILT-IN TELEVISION AND RADIO SET

SPRING CONTACT ROLLER BRUSHES PICK UP CURRENT FROM INLAID COPPER RAILS

PNEUMATIC BUMPER

ELECTRIC MOTORS DRIVEN BY CONVERTED SUN POWER

OVERHEAD PICK UP WHERE DESIRABLE

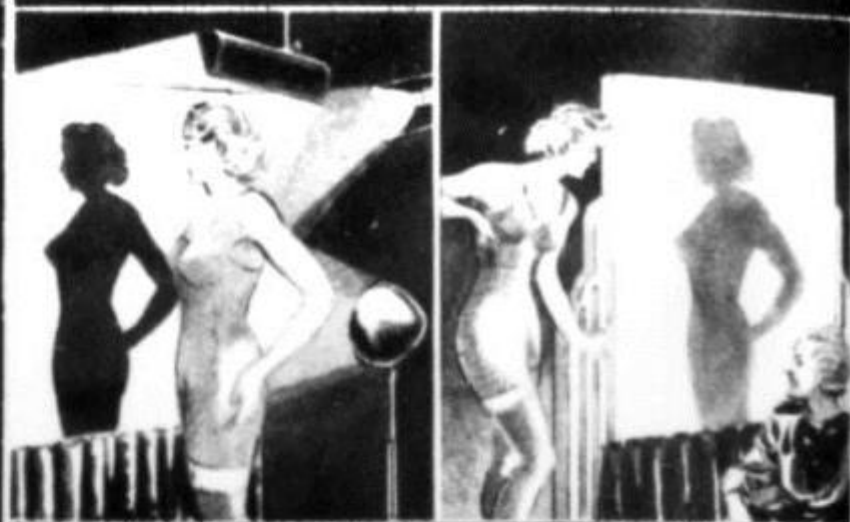
ENERGIZED ROAD BED FOR SUPER HIGHWAYS

CELLS

CELLS

Our artist's conception of the super-highway of the future, suggested by the author. Acres and acres of cells line both sides of the highway where they convert the energy of the sun into electricity which is fed to the roadway, which in turn feeds it to the cars.

SECTION THROUGH SOLAR-ELECTRIC HIGHWAY



Left: The author shakes hands with his own shadow, cast on the phosphorescent screen at the "House of Magic." Above is the suggestion of a woman visitor to the exhibit—using the screen so that women shoppers might see their own body profile and buy accordingly—or else walk out, highly insulted!

in the "House of Magic" suggest to me for future use, although I am not prepared to build you a sun motor for your automobile.

I think the sun motor appeals to nearly everyone's imagination. We all know that practically every bit of our energy on this world comes from solar radiation. The utilization of that energy is one of the problems of the future. We now have a motor that runs with electricity made from light. That seems to hold a rather important possibility in the future. Can't you just visualize in the world of tomorrow that we can take from the light of the sun—and not only from the light but from other solar radiations—the very power which is required to run our homes, to use in communications and in all means of transportation?

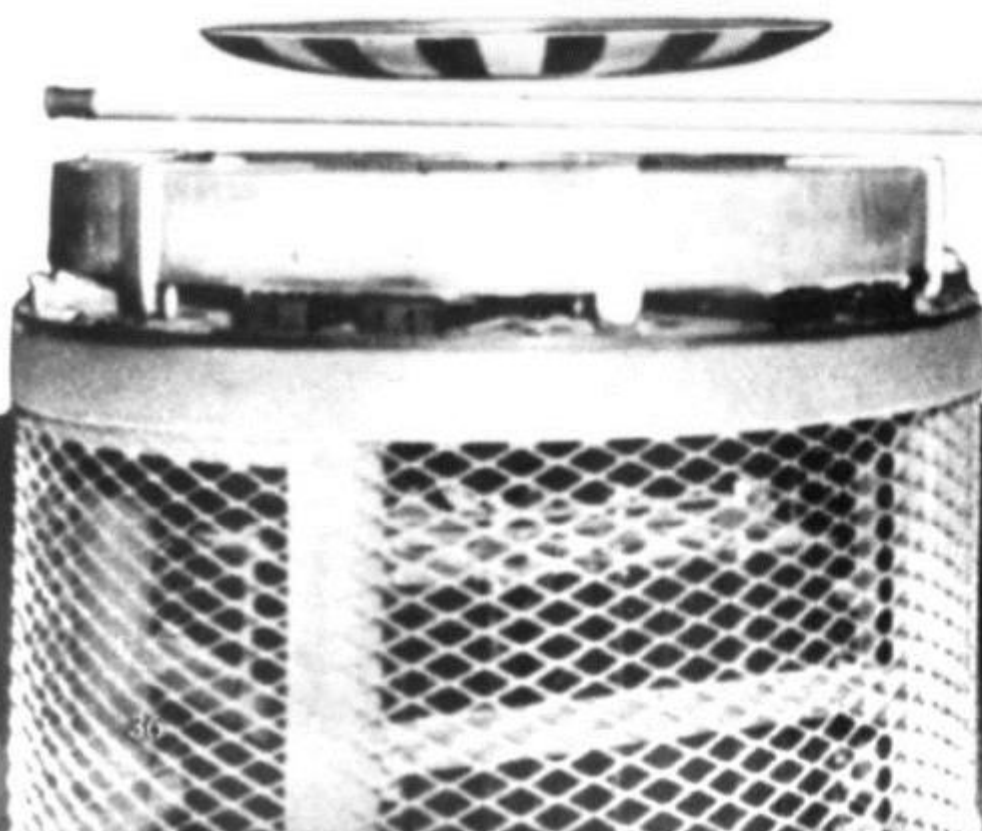
The "power plant" for our sun motor in

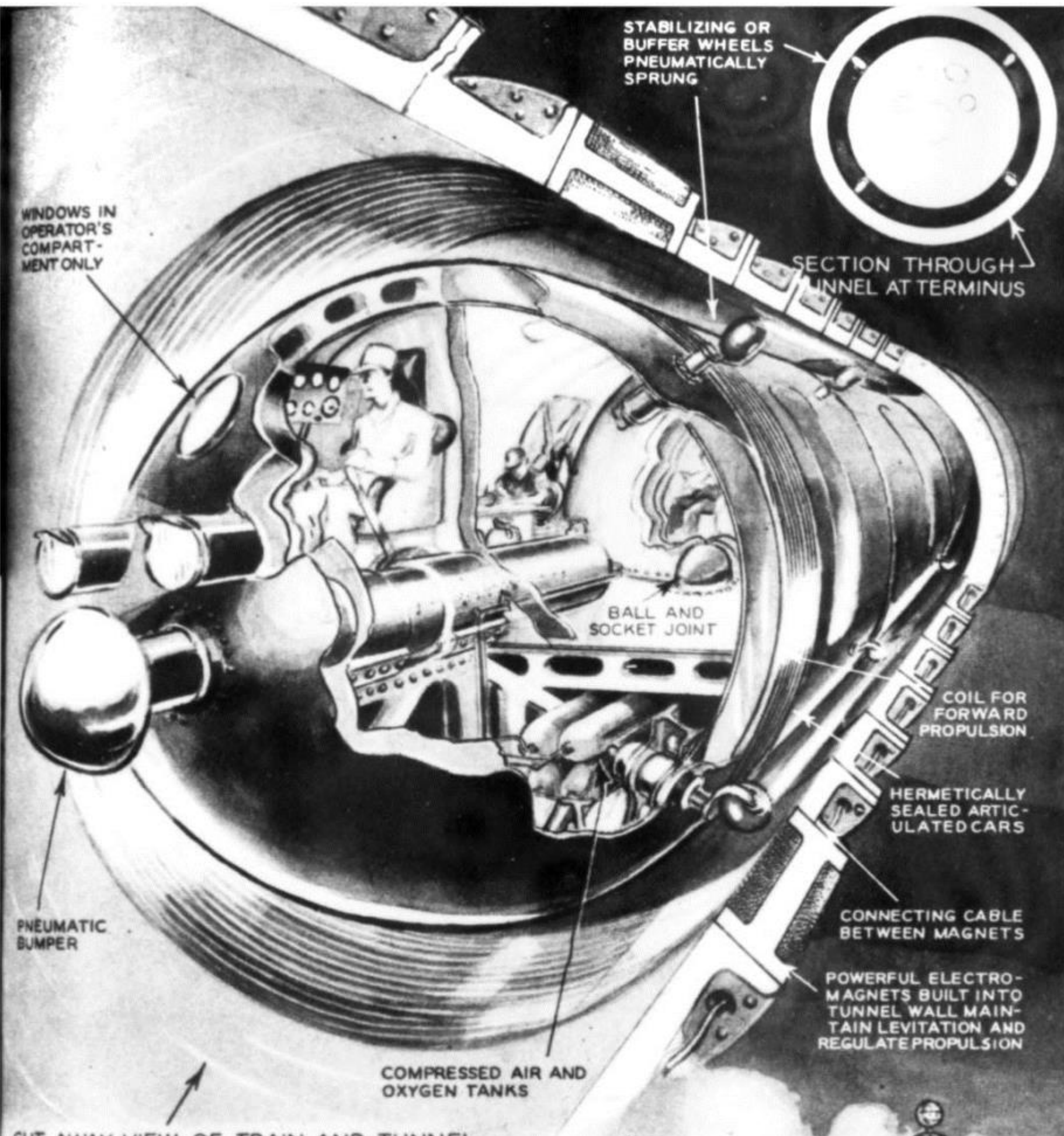
the "House of Magic" is a small bank of photo voltaic cells. These cells convert the energy of light into electric energy. It has been pointed out that it takes perhaps an acre of so-called photo voltaic cells to convert enough sun light into energy to run even a small motor of less than one-quarter horsepower. Obviously it would be somewhat awkward to carry an acre or more of cells around with us to run our automobile.

But on the other hand, suppose that we convert all the solar radiation into electricity with cells of this type. Then we will not have to carry even a quarter of an acre of cells on our car. Instead, let's take a super-highway and plant acres and acres and acres of these cells along both sides of the highway to convert the sunlight and energy of the sun into

[Continued on page 128]

The late Floyd Gibbons, who first called the General Electric Research Laboratory the "House of Magic," waves his cane through the space between the electromagnetic levitator and the metal bowl which floats in the air above it.





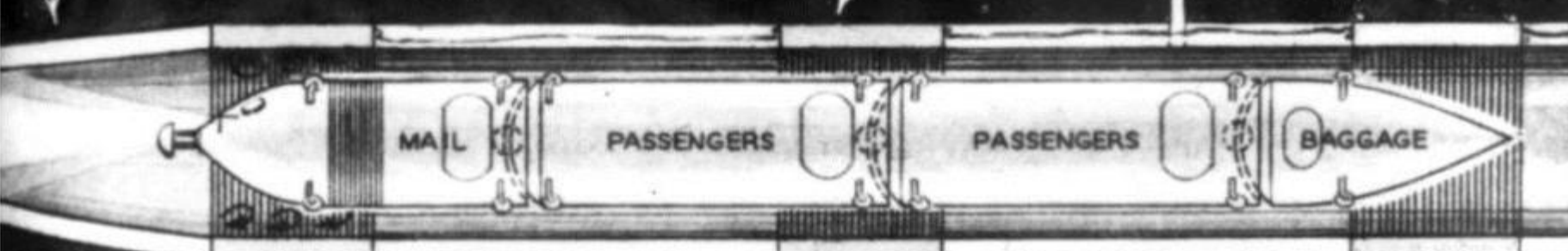
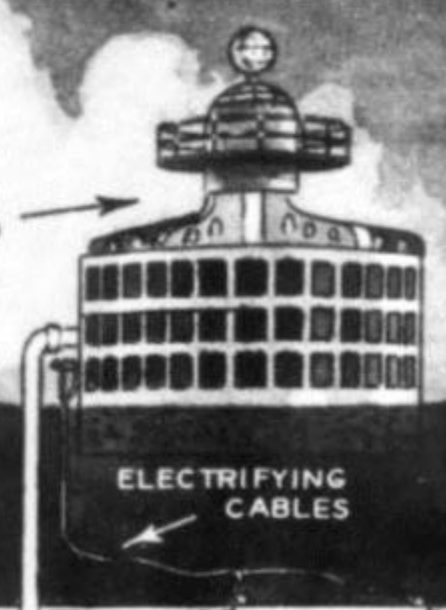
CUT AWAY VIEW OF TRAIN AND TUNNEL

Will this be the train of tomorrow? Entirely sealed, the train will run in a vacuum tunnel, propelled at a terrific speed by a magnetic field, with practically no pressure or friction to slow it up.

POWERFUL GENERATOR AND PUMP STATIONS 100 MILES APART SUPPLY CURRENT AND EXHAUST ALL AIR FROM TUNNEL

TUNNEL CONVERGES GRADUALLY TOWARDS APPROACH TO TERMINUS UNTIL FINALLY ALL BUFFER WHEELS ENGAGE FULLY RETRACTED

AIR SUCTION PIPE TO PUMP
ELECTRO-MAGNET



SECTIONAL VIEW OF TUNNEL SHOWING TRAIN SUSPENDED IN MAGNETIC FIELD

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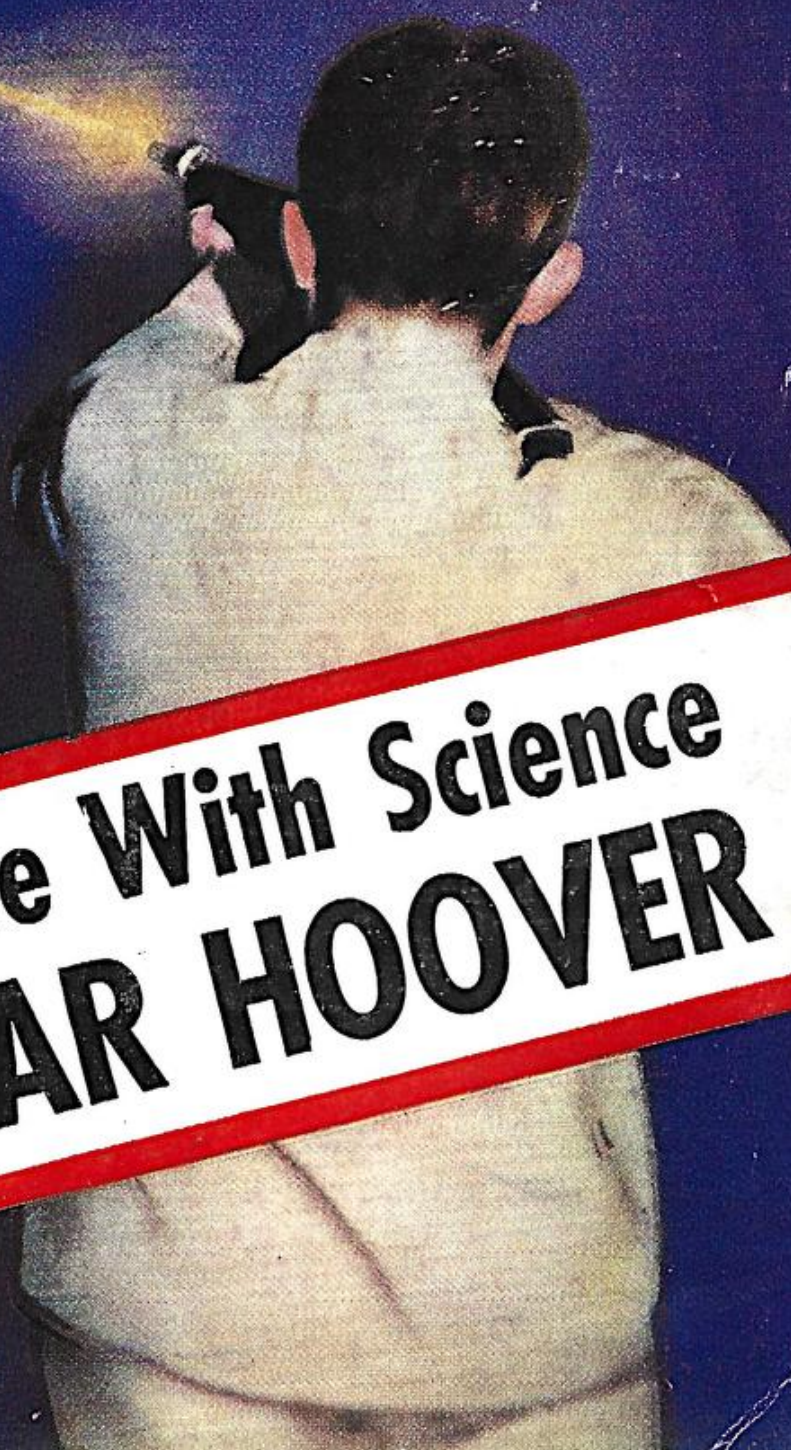
OCTOBER

MECHANIX ILLUSTRATED

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SPECIAL PHOTOGRAPHY
SECTION • SEE PAGE 119



G-Men Fight Crime With Science
....Says J. EDGAR HOOVER

OCTOBER 1938

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OCTOBER
1938

Volume XX
Number 6

Circulation over 250,000

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THE MUMMY-CLOTH MYSTERY

IMAGINE a textile fibre $8\frac{1}{2}$ times stronger than cotton, 6 times stronger than silk, 4 times stronger than flax or hemp that grows like cane and gives 3 to 5 crops a year! This is Ramie, an enigma to science for 56 centuries. It has been variously called iron-cloth, China-glass and kari-mushi. The story of Ramie, or mummy-cloth, is one of romance and wonderwork. It will be told next month in MECHANIX ILLUSTRATED.

HAIL as big as baseballs that rain from heaven in a storm of death is the subject of "Hail from Heaven" also to be told in November. Look, too, for Flash Williams' own story, "I Risk My Neck for a Thrill." Read about Flash's narrow escapes as a dare-devil driver and of his "return from hell" stunt.

Coming

Be sure and read the details of the nation-wide Paramount-Fawcett Publications Prize Contest which will appear in the November issue. The contest is one that every MI reader can enter and will be based on events portrayed in Paramount Pictures' new production, *Men With Wings*, the first All-Technicolor aviation picture ever filmed!

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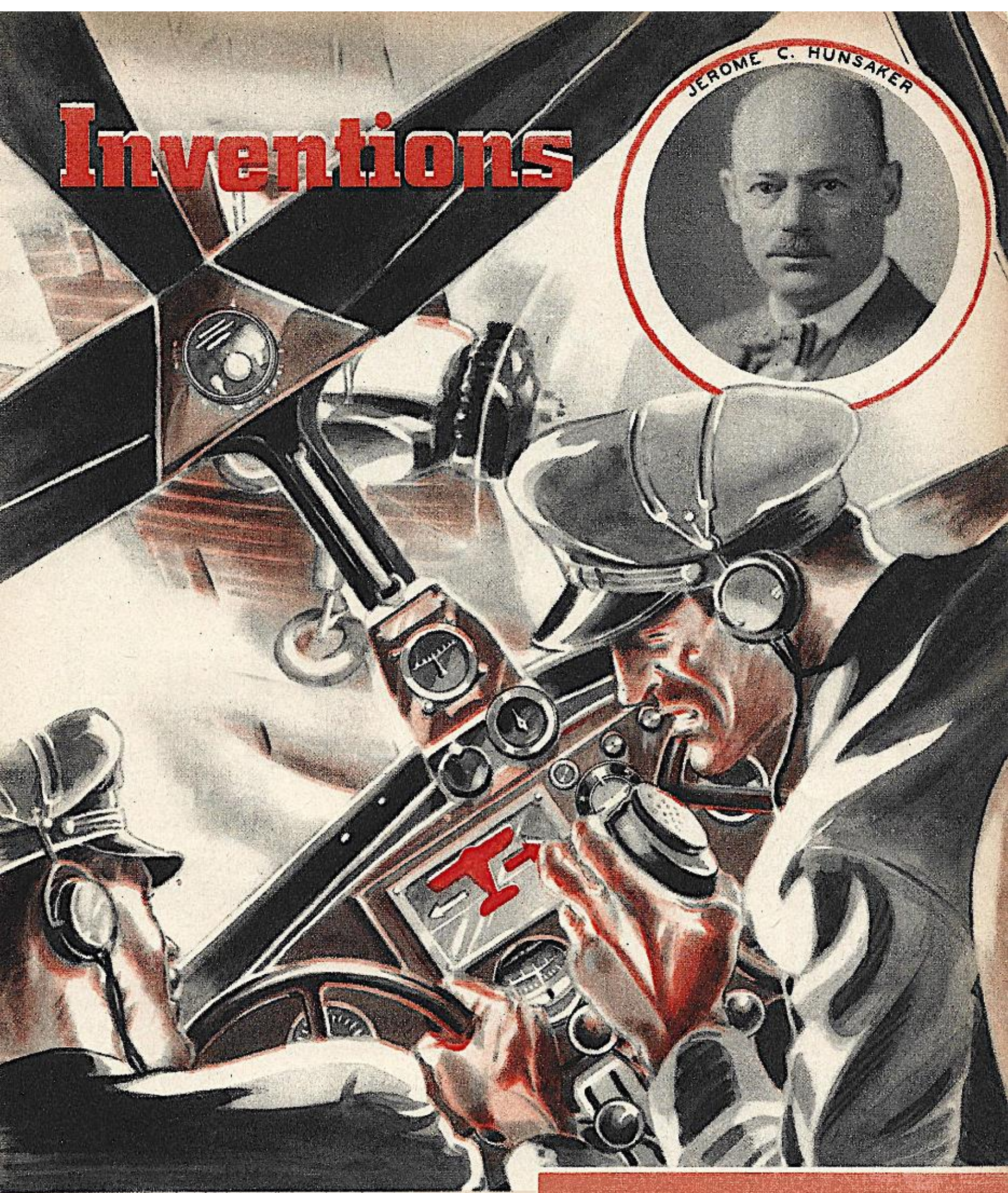
Tomorrow's



AN IDEA today may be an actuality tomorrow. For years scientists have been working on a means for utilization of solar energy and reports from the West coast indicate that some degree of success has been attained. On this page is visualized my suggestion that such utilization of solar energy might take the form of electrical, chemical or mechanical conversion of the heat of incident

Mechanix Illustrated—October, 1938

Inventions



radiation which is nearer accomplishment than the-man-in-the-street realizes. The illustration on the right visualizes my suggestion for a warning device to avoid collision of airplanes when flying blind. It is not too much to hope for realization of these and other ideas suggested by engineers and scientists whose practical experience indicate a need for new inventions.

formerly Modern Mechanix

A NOTE ABOUT THE AUTHOR

JEROME CLARKE HUNSAKER is professor-in-charge, department of mechanical engineering, Massachusetts Institute of Technology. He is a graduate aeronautical engineer; was in charge of aircraft design U. S. Navy; developed wire and radio services for airways and has been honored by scientific societies throughout the world.

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JANUARY

MECHANIX ILLUSTRATED

Now 15¢



BOY
CONVENTION!

Big Money for Home Workshop Fans

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15 CENTS

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MECHANIX ILLUSTRATED

JANUARY
1939

Volume XXI
Number 3

Circulation over 250,000

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DIVER BATTLES OCTOPUS

HOW WOULD you like to battle a 24-foot octopus 20 fathoms under the sea? That's the thrilling life and death adventure of Lieut. Harry Rieseberg, whose diving bell was attacked by a monster squid. Eight tentacles studded with pores, each with a suction capacity of 19 lbs., flayed the bell, knocked its occupant unconscious and tried to drag it to a hidden underwater haunt. Read how Lieut. Rieseberg killed the octopus and filmed the stirring battle from beginning to end. These pictures, the most spectacular ever recorded in history of a battle between a man and an octopus, will be shown in the February issue of MECHANIX ILLUSTRATED.

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TOMORROW'S INVENTIONS

PARTIALLY "DE-GRAVITATED" PLANE ASCENDS OR DESCENDS WITH AID OF PROPELLERS TILTED TO SUIT ACTION DESIRED

REMOTE-POWER DRIVEN MOTORS PIVOTED FOR TILTING UP, OR DOWN AS SHOWN

SPHERICAL LANDING WHEELS

REAR "PUSHER" PROPELLER TILTED DOWN TO AID CLIMB AND MAINTAIN LONGITUDINAL TRIM DURING PERIOD OF ASCENT

ENTIRE AREA OF LANDING FIELD OR ROOF OCCUPIED BY ADJOINING UNITS FOR PRODUCTION OF TERRIFIC COMBINED VERTICAL AIR-BLAST TO SUPPORT PLANE

VERTICAL WIND SOCK TO INFORM PILOT POSITIVELY THAT BLAST IS FUNCTIONING PROPERLY

HONEYCOMB STRAIGHTENS AIR BLAST

POWERFUL FAN

CONTROL ROOM

ENERGIZED BEAMS MAY POWER AS WELL AS GUIDE TOMORROW'S AIRLINERS

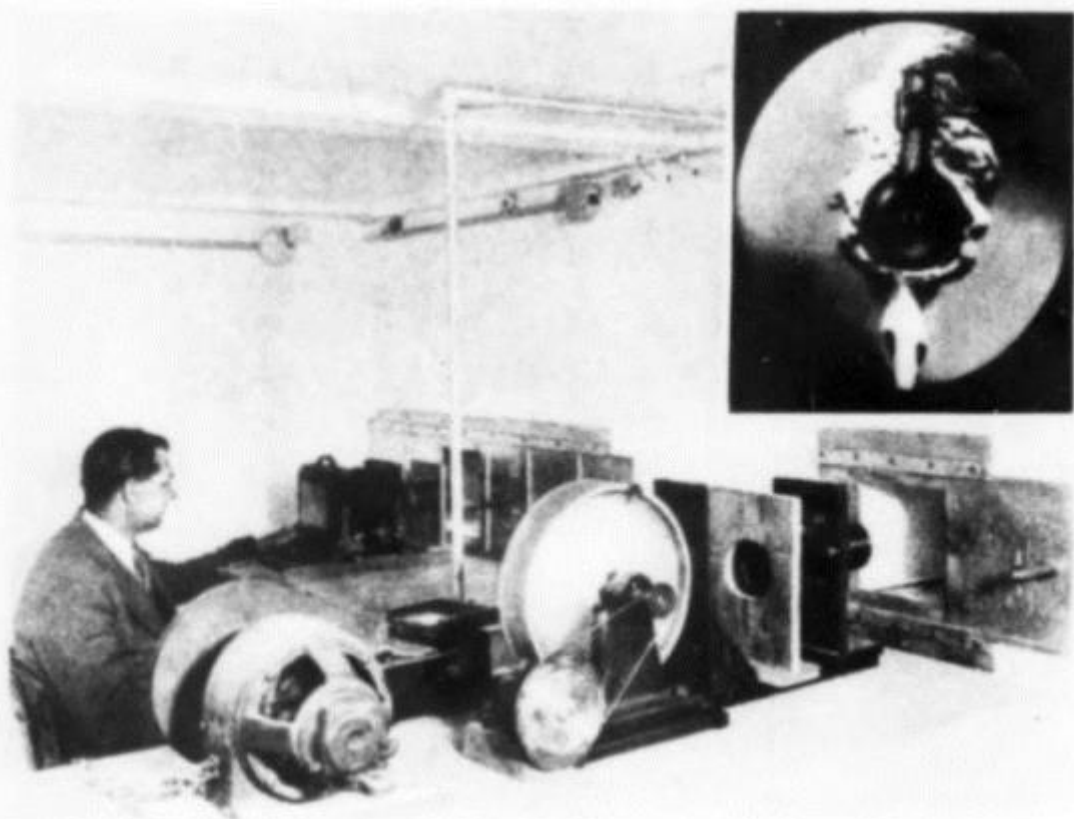
OVERLAPPING BEAMS

POWER STATIONS 50 MILES APART



New Lightweight Bus Has Two Sections

THIS forty-seven-foot lightweight aluminum bus, largest in the world and specially designed to make possible the carrying of more passengers in fewer buses, has a jointed body with a flexible rubber hood. It carries 120 to 140 persons. The bus will speed smoothly over bumps and depressions at fifty miles an hour. The increased carrying capacity will be particularly valuable during the morning and afternoon rush hours.



Camera Photographs Hot Air Currents

A NEW camera has been constructed which takes pictures of currents of hot air. Although the eye has been capable of seeing these currents or heat waves, until now, a camera has been unable to catch them. The equipment necessary to take these pictures is shown in the large photograph at the left, while the insert shows the actual heat waves as they move upward around a glass flask.



"Skim-Board" Gives New Thrill To Water

THE latest addition to aquatic sports is this "skim-board," the invention of Emil Hansen, a Media, Pa., automobile mechanic. It is nine feet long, weighs ninety pounds, and is made in four sections. It is driven by a four-horsepower engine that gives it a speed of twenty miles an hour, and carries sufficient gasoline for an hour's trip. The photograph shows the "skim-board" assembled, with Mr. Hansen about to start the motor.

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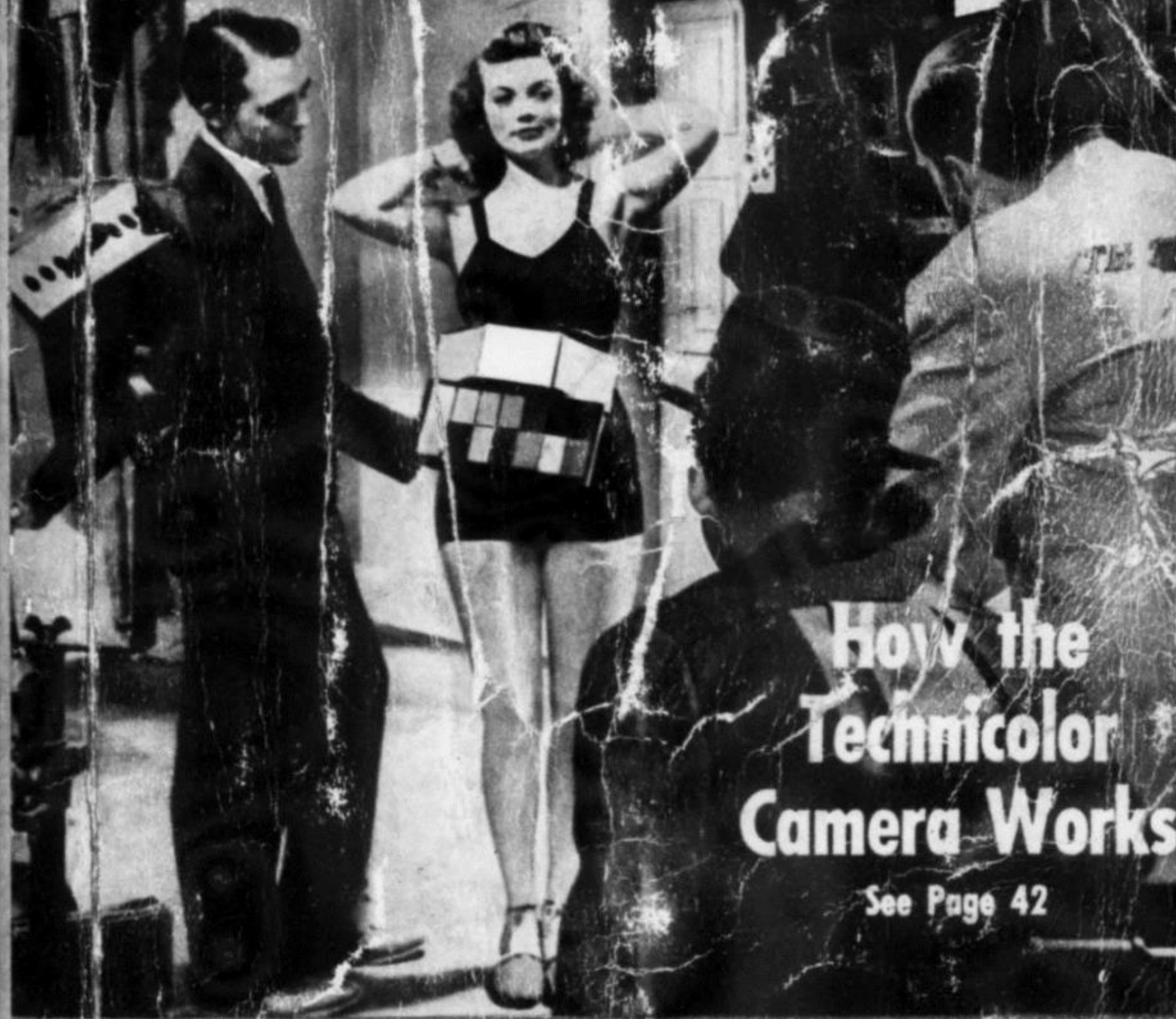
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Reg. U.S. Pat. Off.

MECHANIX ILLUSTRATED

now **10**



How the
Technicolor
Camera Works

See Page 42

THIS MAGAZINE GUARANTEED!

Satisfaction or Double Your Money Back • See Page 58

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MARCH
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Number 5

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By Roland Cueva

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AIR RAID!

London, Paris, Berlin, Rome, New York, Tokio, Moscow—these are the nerve centers of the world! These are the proud cities of today destined to be mere heaps of smoldering ruins when monster bombers raid them tomorrow. Is there a defense against flying fortresses and long-range bombers? Can foreign war planes really penetrate military defenses and devastate populous areas?

Major Al Williams will answer this question for you in the second of his series of articles which will appear in the April issue of **MECHANIX ILLUSTRATED**.

"There's precious little defense," says Major Williams, "against a determined air attack. You can't hide from war planes dropping deadly 2,000-pound bombs."

If you have an idea that non-combatants will be safe in the next war, read Major Williams' story—you are due for a rude awakening.

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SPOTTING PLANES WILL
REPLACE THE PRESENT
LOFTY FIRING CONTROL
STATION

TOMORROW'S MAN-OF-WAR



ESTIMATED
COST OF NEW
BATTLESHIP

FULLY PROTECTED
SMOKE STACK,
VENTILATORS,
ETC. TO LESSEN
DANGERS OF
AIR ATTACK

REPRESENTATIVE PRESENT
DAY WARSHIP DEPICTED
ABOVE IS DRAWN IN
SAME APPROXIMATE
SCALE. NOTE THE
ALREADY EXISTING
TENDENCY TO
ELIMINATE
THE SUPER-
STRUCTURE

DOUGLAS
ROLFE

A COMPOSITE picture of the 100-million-dollar, 45,000-ton battleship urged by President Roosevelt, is shown here by our artist, Douglas Rolfe. If built, the super-dreadnought will be 750 ft. long, 108 ft. wide, top speed will be 25 knots, it will have 12 16-in. guns or 9 18-in. guns, and 60,000 h.p. It will carry anti-aircraft guns, combat planes and a spotting plane to direct gun fire.

18 TO 20 MILES

EFFECTIVE FIRING RANGE

15,000 BLUEPRINTS
WILL BE REQUIRED
TO COMPLETE THE
WARSHIP'S DESIGN!

4 PLANES
CARRIED IN
BOARD FOR
SERVICE AS
"SPOTTERS"

BRIDGE

DISPLACEMENT
OR TONNAGE

45,000
TONS OF
WATER



HORSEPOWER — EACH COMPLETE SYMBOL REPRESENTS 10,000 HORSEPOWER (OIL-STEAM TURBINES)



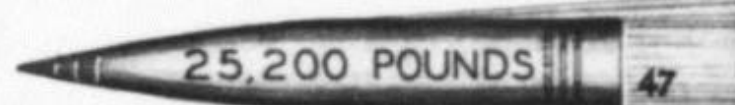
SPEED — 25 KNOTS, APPROX. 29 MILES PER HOUR



MAIN OFFENSIVE ARMAMENT — EACH SYMBOL REPRESENTS THREE 18-INCH GUNS OR FOUR 16-IN. GUNS IF THE SMALLER CALIBER IS DECIDED BEST

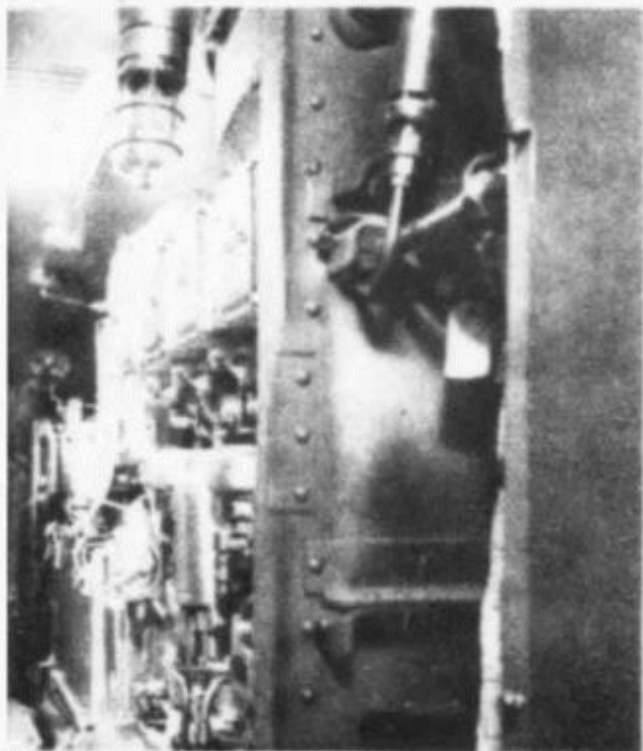


MAIN DEFENSIVE ARMAMENT — EACH SYMBOL REPRESENTS FOUR 5-INCH COMBINATION GUNS FOR ANTI-AIRCRAFT AND ANTI-TORPEDO PURPOSES



PROJECTILE WEIGHT OF A FULL BROADSIDE

First Steam-Electric "Iron Horse" Speeds Over Rails at 125 M. P. H.



Comfortably seated before the controls (right), the engineer of the new 5000 H.P. steam-electric locomotive has a clear view of track ahead through a wide window.

Left—Interior view of the nose of the engine cab showing the controls which automatically regulate the supply of fuel fed to the steam boilers.

The two units, which make up the complete two-cab locomotive (below), each weigh 265 tons and are 90 feet long. Electrical braking insures short, but smooth, stops.



FEATURING a top speed of 125 m.p.h., a new type of streamlined electric locomotive, which uses a steam turbine plant to generate current for its six driving motors, was demonstrated for the first time before a party of railroad men, officials of the company which built it and newspapermen at Erie, Pa., recently. Though neither turbines nor turbo-drive in itself is particularly new, it is the first time that either has been successfully applied to locomotive purposes. As efficient as conventional locomotives, it is as efficient as conventional locomotives and able to operate for

(500-700 miles) without stopping for fuel or water, the 5,000-horsepower giant was designed and built by the General Electric Company for the Union Pacific Railroad. It will be put through a series of exhaustive operating tests before being placed in scheduled service.

Because it has a steam turbine, burning the fuel oil in a fire box instead of in an internal combustion engine, the new "iron horse" operates on a low grade of "bunker oil," which is cheaper than the type of oil required in diesel engines.

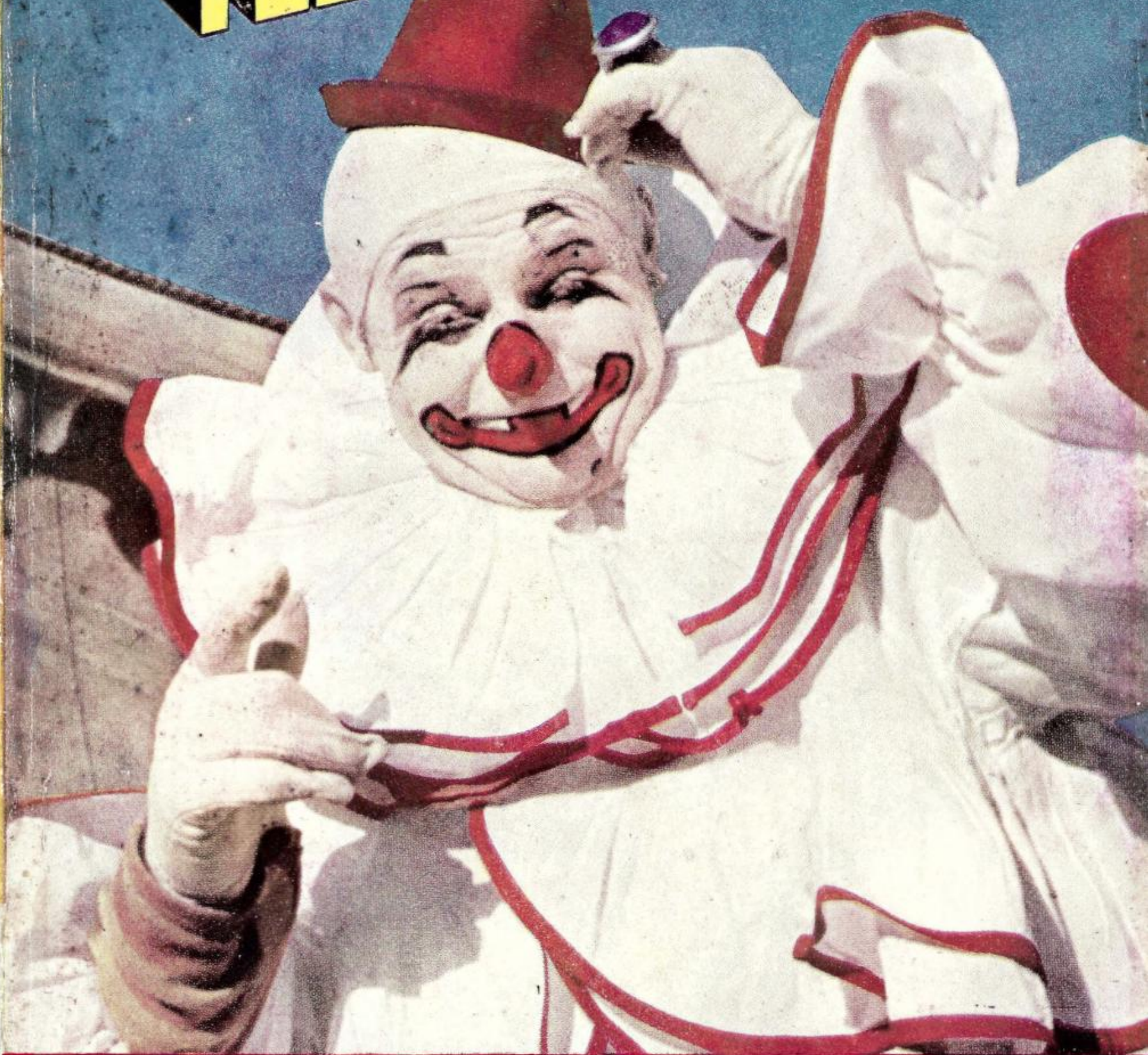
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AUGUST
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MECHANIX ILLUSTRATED

FORMERLY MODERN MECHANIX

15¢



SECRETS OF THE CIRCUS ENGINEERS!

Get acquainted with our PHOTOGRAPHY SECTION • Page 119

AUGUST 1938

MECHANIX ILLUSTRATED

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FORMERLY MODERN MECHANIX

AUGUST
1938

Volume XX
Number 4

Circulation over 250,000

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by Maxwell Frederick Coplan.

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Published monthly by Fawcett Publications, Inc., 11th Street and Broadway, Louisville, Kentucky. Executive Office—22 W. Putnam Avenue, Greenwich, Connecticut. Editorial and Advertising offices—1501 Broadway, New York, New York. Send subscriptions to the Louisville, Kentucky, or Greenwich, Connecticut, addresses.

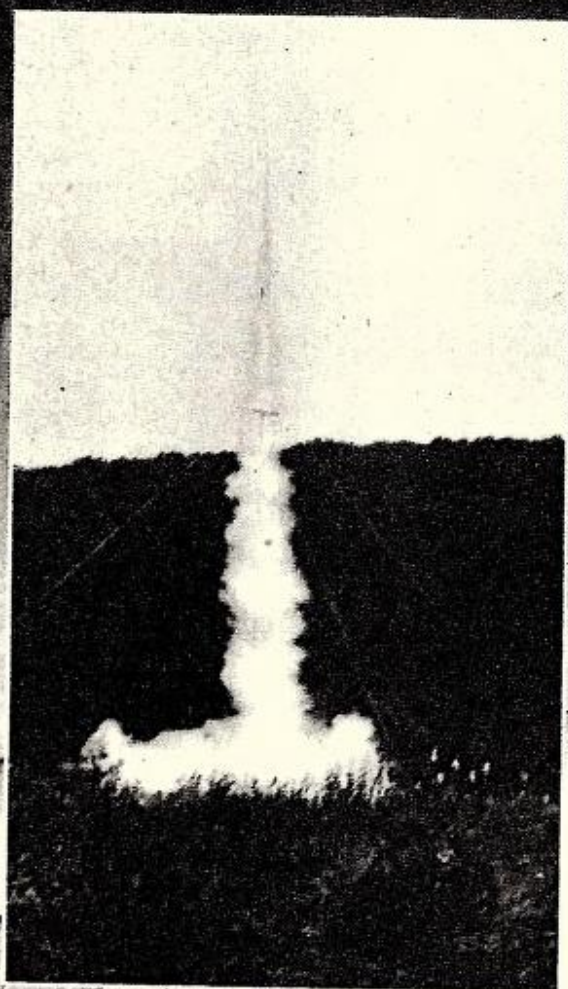
Entered as second-class matter under the Act of March 3, 1879, at the post office in Louisville, Ky., with additional entry at Greenwich, Conn. Not responsible for unsolicited manuscripts. In U. S. and Possessions and in Canada, 15c a copy; \$1.50 a year. Other Postal Unions, \$2.00 a year. East Indian Agent, P. C. Eranee Sons, Bombay, India. Printed in U. S. A. Advertising forms close the first of second month preceding date of issue. Advertising offices: New York, 1501 Broadway; Chicago, 360 N. Michigan Ave.; San Francisco, Simpson-Reilly, 1014 Russ Bldg.; Los Angeles, Simpson-Reilly, Garfield Bldg. Member Audit Bureau of Circulation.

W. H. FAWCETT, Publisher RALPH DAIGH, Managing Editor ROBERT HERTZBERG, Editor AL ALLARD, Art Director
JOHN L. SCHERER, CLIFFORD PETERS, STANLEY GERSTIN, Associate Editors S. S. RABL, Naval Consultant

10,000 Miles an Hour!

Rocket flights of tomorrow will circle the earth in 3 hours—maybe.

by Allan Finn



Recent tests at Pawling, N. Y., showed promise. A roar and a cloud from the exhaust—and the rocket streaks skyward at 700 m.p.h.

WALK past almost any flowered field or meadow from Connecticut to California these fine summer afternoons and as likely as not you'll see little knots of agitated men pattering with strange-looking contraptions which hiss and let off gaseous odors. Edge over to satisfy your curiosity and some of them will come running up warningly to shoo you away.

There's a good reason for the presence of so many mysterious looking men. Rocketry is making tremendous strides in its development as an embryonic science. Over the past winter there have been many important

Mechanix Illustrated—August, 1938

At $2\frac{3}{4}$ miles a second, a rocket of tomorrow will describe a parabola at 600 miles, its power will be shut off and the rocket will coast to earth!



Winter (above) and summer (left) found rocketeers testing their creations. Note tail design and different shapes.



developments in cellar and garret workshops everywhere. Under the clear skies of July and August tests are being made to ascertain their practical value.

For one thing, a dozen new motors—combustion chambers with their flame-emitting nozzles—are undergoing trials. Tests now in progress have definitely passed rocketry from the hobby to the engineering stage. Its rule of thumb days are over, its votaries the aerial giants of tomorrow.

In this transition the two basic problems of the science have been conquered, to-wit: how to use and control explosive and volatile

fuels and how to burn them properly to gain the necessary thrust or recoil in take-offs. This procedure is facilitated by the fact that the fuels now used—oxygen and gasoline mixture or oxygen and alcohol—are not in themselves explosive. They are easy to feed to the combustion chamber, too. Liquid oxygen is automatically forced from its tank into the burning compartment by the pressure of its own evaporation.

Gasoline or alcohol is pressed inside by compressed carbon dioxide or nitrogen. Flow

of the intermingling fuels also is controlled by valves.

Moreover, rocket men have developed motors with sufficient thermal efficiency—about 10 per cent—for present experimental shooting requirements. In addition a number of smaller problems relating to dynamics and aerodynamics have been solved or nearly solved.

Armed with these substantial achievements experimenters confidently believe that rocket flights of 25 miles are close at hand, flights of 100 miles around the corner and flights across the Atlantic a definite possibility within our lifetime. More, they believe there is plenty of theoretical basis and some evidence for the conviction that given enough money, power,

experimental data, they could shoot their devices to the moon.

Although such flights at present are only in the realm of speculation, rocket ships for them have been designed and the problems of their propulsion and navigation worked out on paper. Ocean-flying rockets would be shaped like a needle, hermetically sealed and steered with gyroscopic fins. Of several compartments, the front of the rocket would be occupied by passengers and crew. Aft of them would be the fuel tanks, the motor, gyroscope and parachute for descending.

Loaded and ready for a flight, say from Long Island to London, the Atlantic rocket would be assisted in its takeoff by some auxiliary. It might be pushed by a powerful locomotive on a sloping rail, catapulted by a titanic wheel or hurled from a cannon's maw after the fashion of Jules Verne's projectile.

Once in the air, the rocket would soar through the stratosphere at an estimated maximum of 10,000 miles an hour, about $2\frac{3}{4}$ miles a second. After describing a parabola at 600 miles, its power would be shut off—by cutting the fuel tanks—and the rocket would coast to its destination. A few miles before landing a parachute released from the rear would check the terrific speed. Thus controlled, the ship would slide to a rest on a wheeled car in a long runway!

Such a flight, it is estimated, would be made in 50 minutes!

Compared with these ambitions actual accomplishments in the air no doubt have been small. Yet they have been no less substantial. Mail, for instance, has been shot over the mountains near Graz in Austria. A live rooster has been catapulted in a rocket over a river in India. There have been rocket glider flights in Germany; test flights of



Above: Rocketmen carefully check their machines with a battery of meters and test combustion (as shown at left) before a flight. Note the testing panel and men crouching behind protecting wall. Rocketman G. E. Pendray (above center) supervises rocket experiments.



rocket-propelled pilotless planes at Greenwood Lake, N. Y.

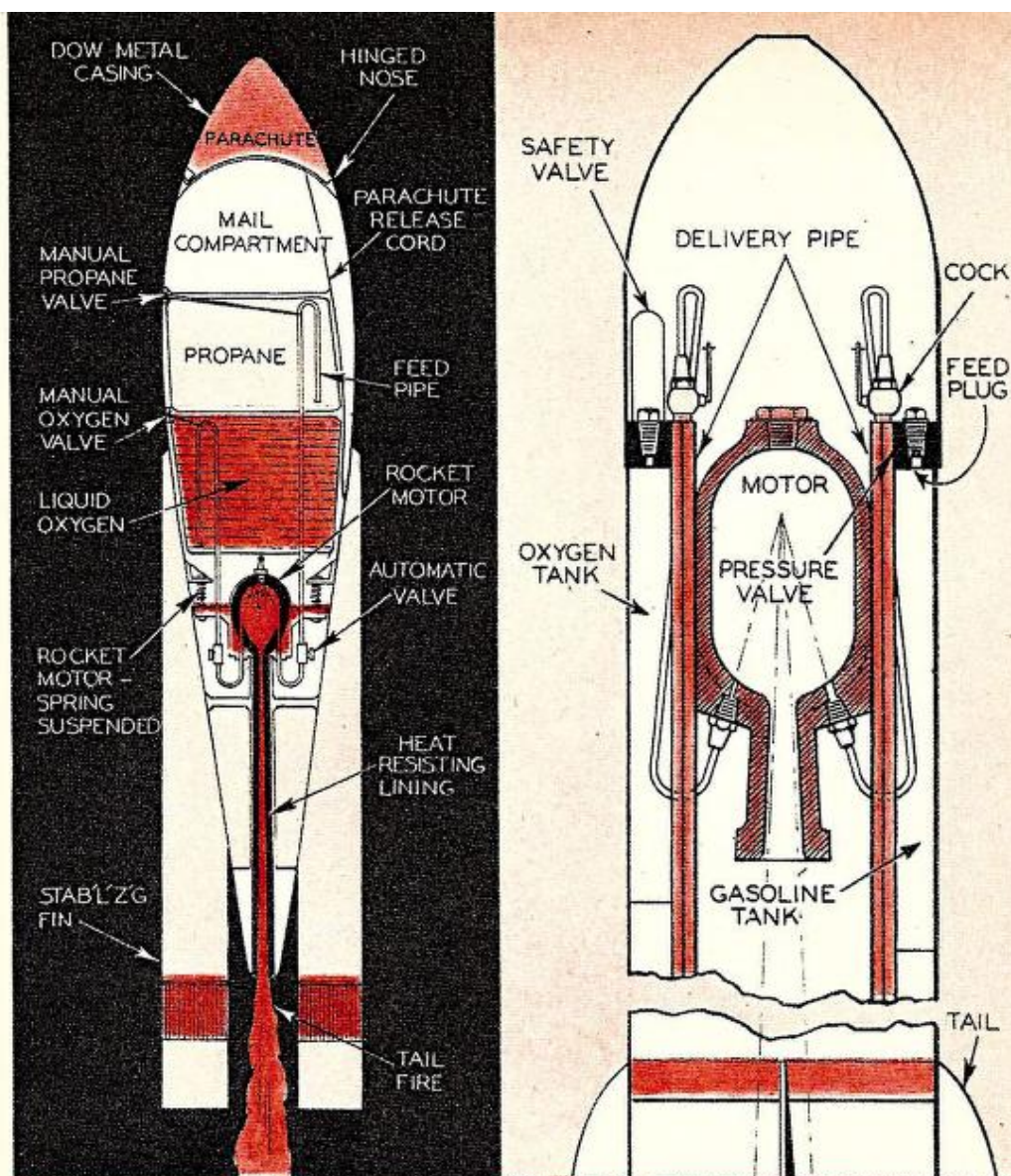
Dozens of dry and liquid fuel rockets, of course, have been sent up with varying success. At present the altitude record for a rocket stands at 7,500 feet. It is credited to Dr. Robert H. Goddard, dean of rocket experimenters. He set it at his laboratory near Roswell, New Mexico, in May, 1935. Doctor Goddard's rocket attained a speed of 700 miles an hour.

Dr. Goddard launches his rockets from a 60-foot rack. The rockets are about 12 feet long, 9 inches in diameter, weigh from 30 to 80 pounds. The actual motor is about 5¾ inches in diameter and weighs about five pounds. Fueled by gasoline and oxygen, these rockets are steered by a delicate gyroscope whose spinning wheels, affected by any change in direction, control vanes guiding the course of the exhaust flames.

Firing, which Colonel Charles Lindbergh, a rocket enthusiast, has witnessed as Doctor Goddard's guest, is simple. The fueled rocket is put on the rack and ignited by a fuse set off electrically from a telegraph key. A blast of white flame issues from the nozzle, and with a terrifying swish the rocket slowly rises from the tower. In a flash it is zooming like a thousand hissing vipers in the sky. The rocket undulates from side to side as the gyro continually corrects its skyward course. On one flight, Doctor Goddard reported, the rocket reminded him of a fish swimming in a vertical direction.

Doctor Goddard has developed motors of sufficient strength to resist the effects of constant firing and he believes he has the stabilizer problem licked. Currently, he is working on weight reduction of his rockets.

As recognition of the public's inquiring mind, the New York World's Fair has prepared a transportation unit with a hypothetical rocket car.



Above left: Cross-section of a designer's conception of a mail rocket showing mail compartment, parachute and rocket motor. Above right: Cross-section showing details of the motor. Below: The start of a rocket flight. Note tower and shape of rocket. Such tests presage flights of tomorrow.



In Germany it is reported the military scientists there have developed a rocket cannon capable of shooting a thousand miles.

The United States Weather Bureau in Washington has been keenly watching developments. It has agreed when rocket men are ready, to allow them the use of delicate

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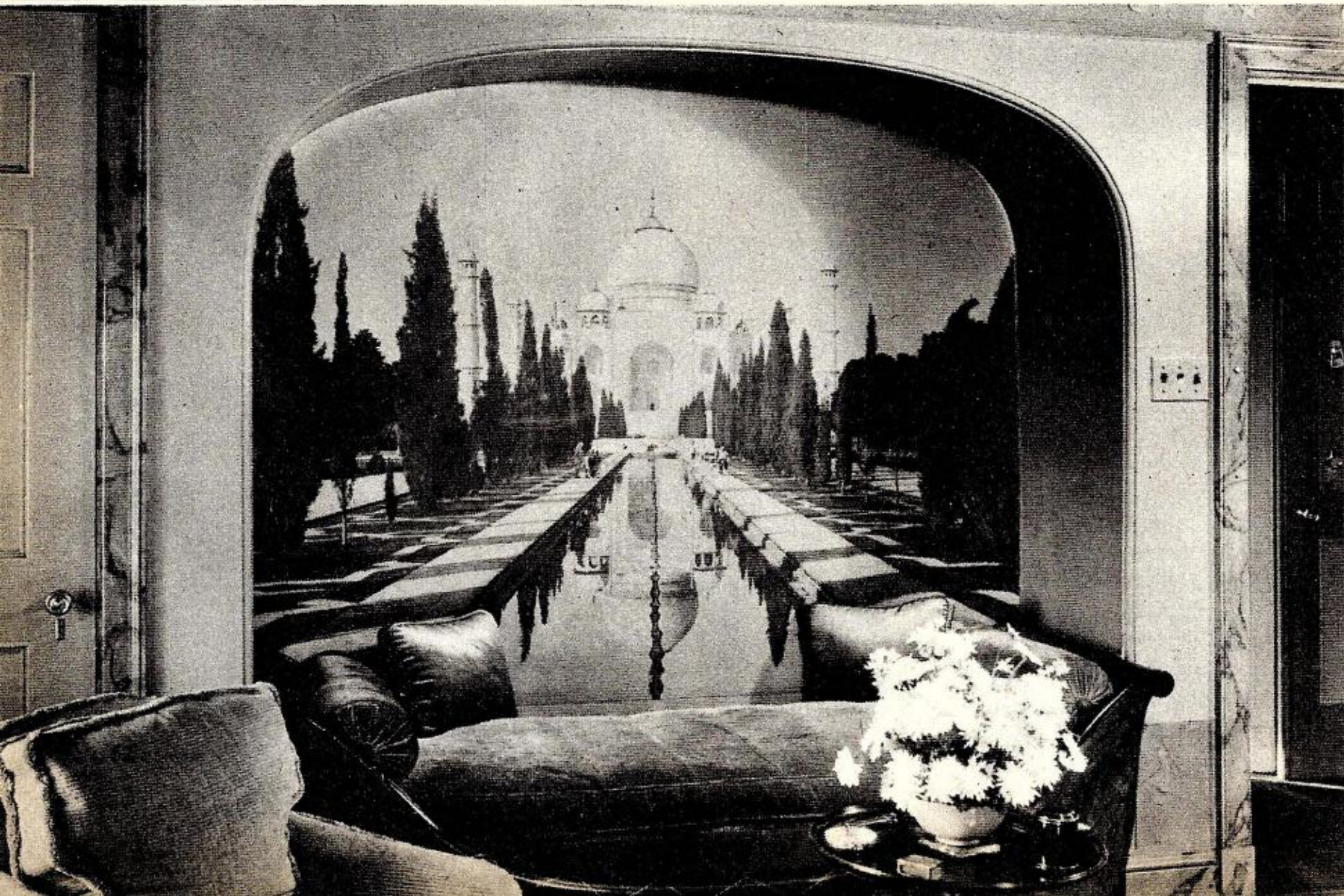
GIANT Pictures



LIKE all big things that have a small beginning, the making of giant photomurals was just a little idea back in 1927, when Mrs. C. B. Goodspeed of Chicago walked into the photo studio of Kaufmann & Fabry. She carried with her a 4x5 negative of India's famed Taj Mahal and explained to the skeptical Messrs. Kaufmann & Fabry that her idea was to have a picture large enough to cover the entire wall of an alcove in her home.

"We told her at once," said Arthur E. Clason, the veteran photographer who eventually completed the job, "that a picture the size she wanted had never been made before. Enlargements, as known today, were unheard of. The widest paper available was only forty inches, so three strips would be required to cover her eight-foot alcove. We were not sure printing could be controlled so that tonal values of these strips would be identical. We feared, too, that due to inability to hold the paper absolutely flat during printing, the curled edge would distort the image. Our big worry, though, was that the dampened paper would stretch without uniformity. There was also the possibility that, due to

Below—Taj Mahal, famed temple of India, was Kaufmann & Fabry's first giant mural. Left—The giant Ford mural is 600 feet long, 20 feet high.



From Pigmy Prints

by H. H. Slawson

improper development, the emulsion on the negative would show a blotched or 'grainy' appearance when enlarged to the unusual size, thus destroying the artistic tone of the finished picture."

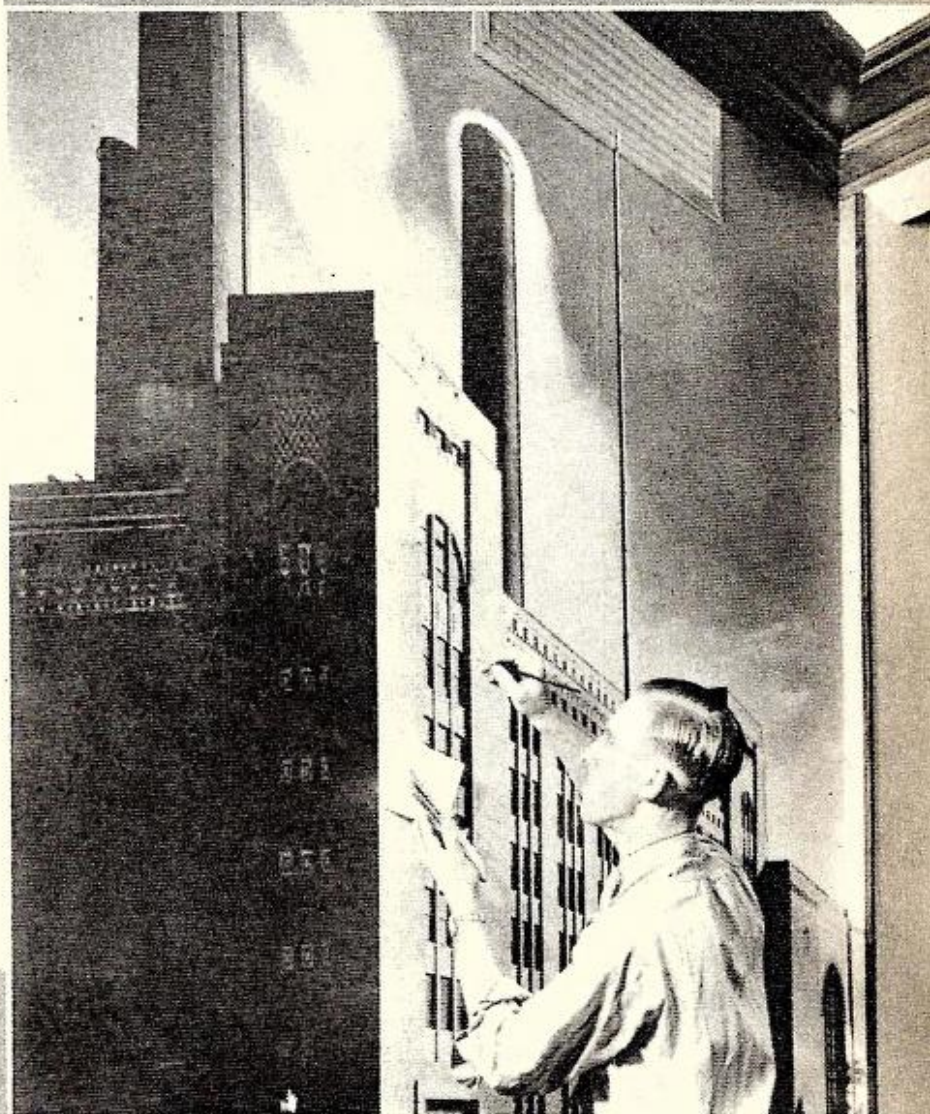
Mrs. Goodspeed departed but did not give up. And finally, when the studio consented to project the negative, it was found to everyone's surprise that it had been correctly exposed and developed. Even when enlarged to twenty-five diameters on the screen, the superior quality of the negative nullified all opposition to the undertaking. After that showing the studio was compelled to accept her order.

"We realized that we were attempting something without knowing the rules, but there was nothing hit or miss about our procedure. Every step was carefully plotted out and our subsequent operations have closely followed that first experience. When the strips were eventually joined on the alcove wall, the images matched within less than a quarter of an inch.

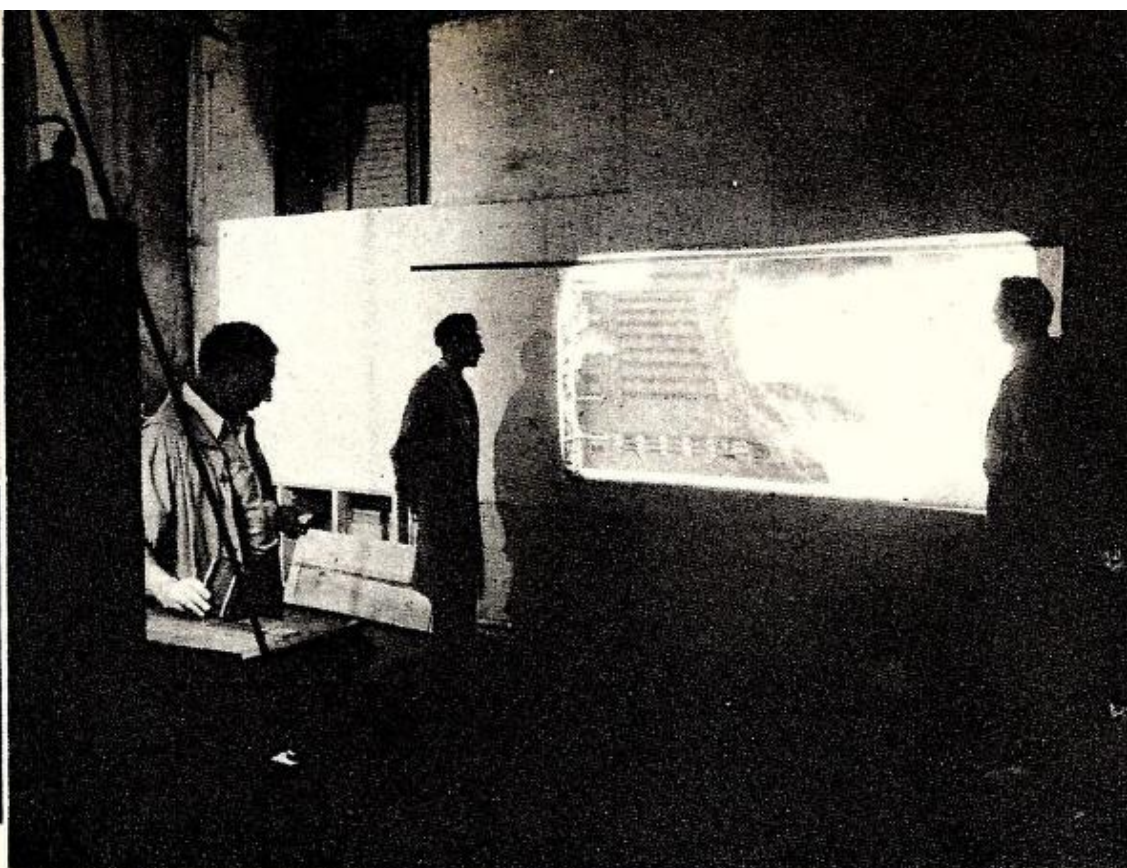
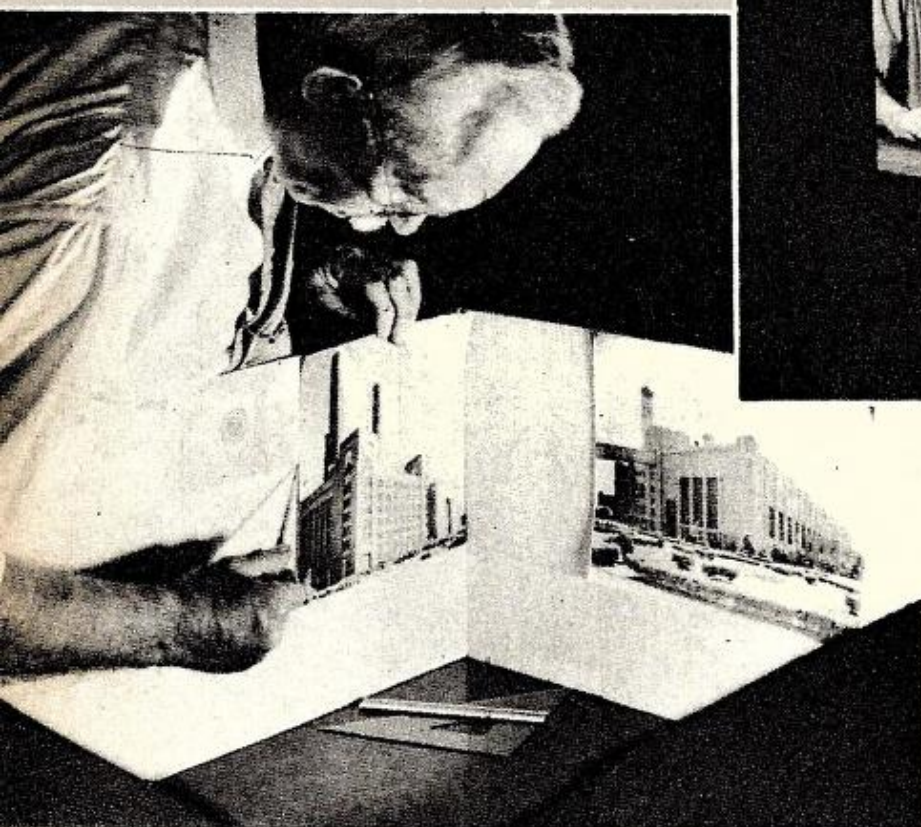
"Mrs. Goodspeed provided the paper-hanger, but we furnished paste, just to be

Huge pictures from tiny negatives have set a new style in interior decoration. A woman's whim started it.

Below—Photomurals made the artistry of this room possible. Right—Final retouching is done on the enlargements themselves. Note the contrast in size between man and picture.



Below—A scale model of the room is first designed to study decorative possibilities. Right—Photographic paper is tacked on a wall and the negative image projected on it.



sure he did not use anything injurious to the emulsion. The paper was applied direct to the plaster, which, as learned from later experience, might have brought disaster. This first job was saved, however, because Mrs. Goodspeed had asked for a 'gold tone' finish and \$50 worth of pure gold bullion was used to produce it. Between that gold coating and the lime no chemical action occurred and today, after nearly twelve years, the world's first photomural still hangs there in all its original bright perfection."

It was not until three years later, in 1930, that the commercial possibilities of photomurals was realized by Kaufmann & Fabry, when they were asked to decorate the walls of a Chicago night club's reception room. Here, after preliminary consideration, a drawing, 6x20 inches in size, the work of the artist, Aaron Douglas; was enlarged to fill every inch of wall space in a room measuring 51x20 feet.

The accomplishment attracted widespread attention and discussion in art circles. Interior decorators began placing orders and then came Chicago's Century of Progress Exposition, which, as Mr. Clason remarked, was "practically baptised with a photomural."

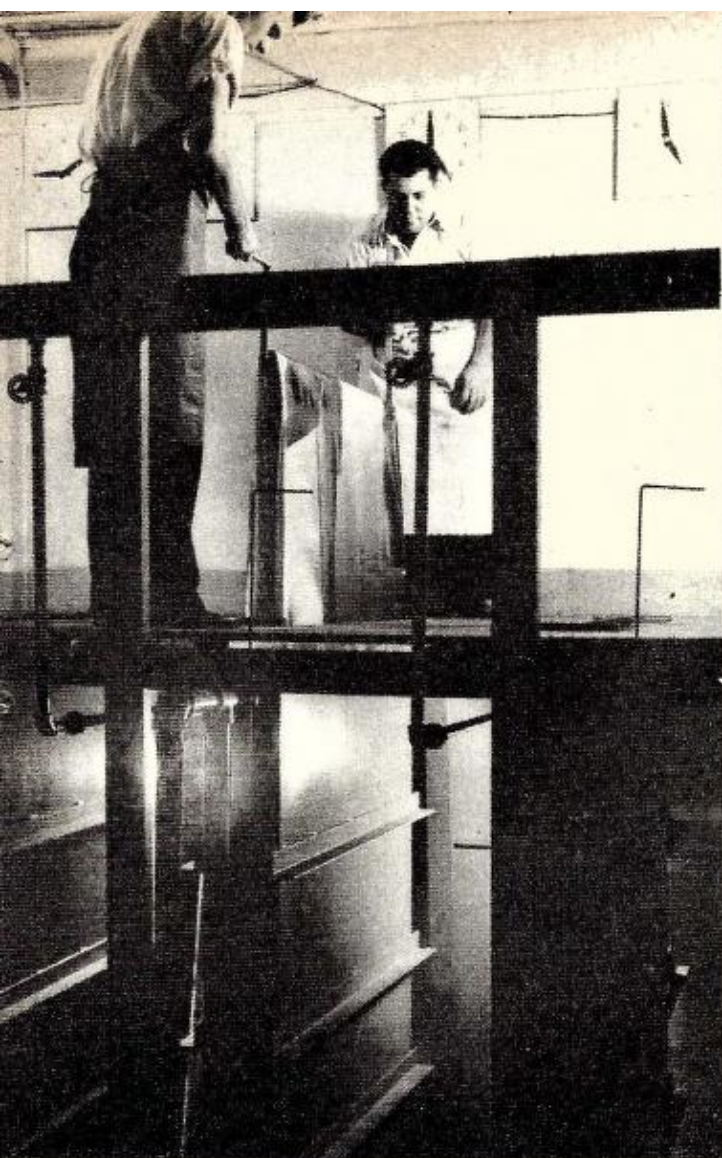
H. M. Pettit, the artist who specializes in

bird's eye drawings, had made a picture visualizing how the fair would look when completed and the exposition's president, Rufus Dawes, thought it would make a fine ornament for the administration building's reception room, "if it could be enlarged a bit." So Kaufmann & Fabry enlarged it quite a bit. Pettit's picture was 26x40 inches in size and the completed photomural was 20 feet, 6 inches high by 35 feet long.

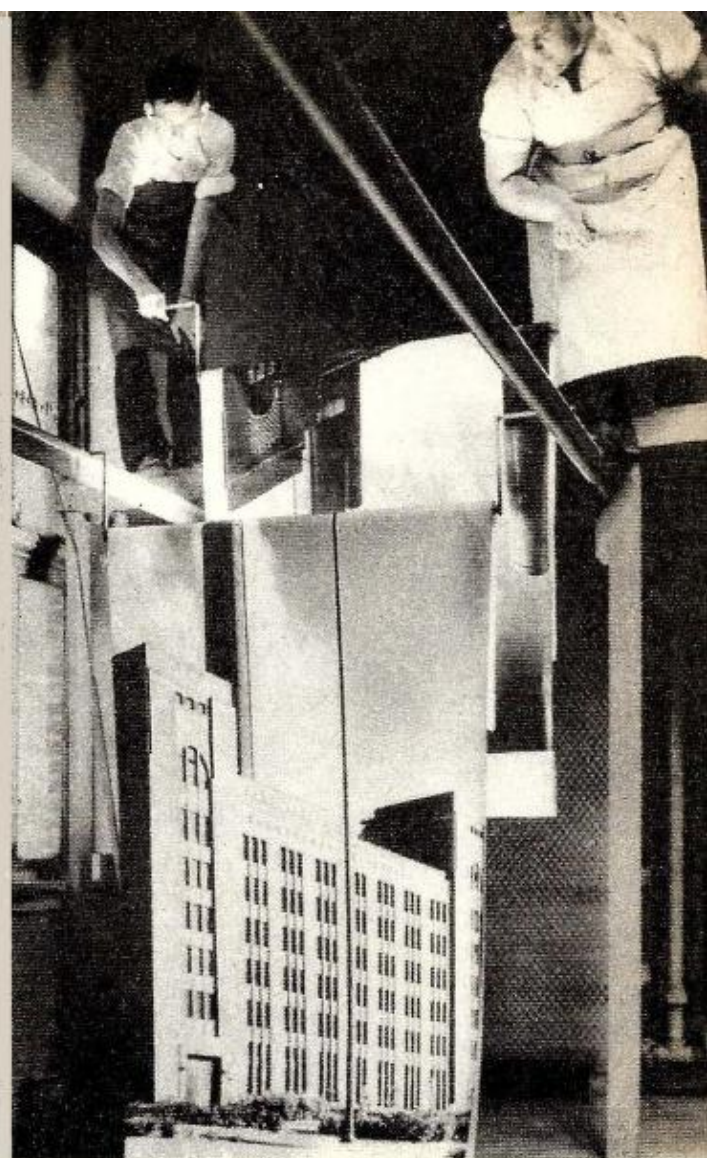
"It was our first real 'whale,'" remarked Mr. Clason, "and gave us our first experience in excessive height and multiple sections. The first photomural had been made in three sections, but since our projector could only throw images about ten feet long, this fair job required thirty-three sections. Today, incidentally, sections twenty-four feet long can be printed without difficulty.

"Those thirty-three sections had to be uniform in tonal values. But variations in strength of light, temperature of developer and a half dozen other factors might combine to cause slips that could not be corrected once we had started. During hanging, expansion, both horizontal and vertical, had to be watched and at the same time moisture content of each section when applied to the wall, must be approximately equal to that in the sections to which it was joined. I stayed on that job like a hawk."

This installation introduced the world to the possibilities of mammoth photographs as a new form of wall decoration. After seeing it, fifty exhibitors placed orders for giant pictures for their 1933 exhibits. Next year this number increased and meanwhile other studios had also begun to produce the new style pictures.



Left—After development, the photographic paper is carefully washed in steel tanks each holding 400 gallons of filtered water and accommodating a print 25 feet long. Left—After thorough washing, the prints are lifted on special holders and placed on the drying racks. Below—The finished job projected by the designer on the scale model on the opposite page is shown here in the office of the plant in the photomural.



It was for the 1934 fair that Kaufmann & Fabry made the world's largest photomural for use by the Ford Motor Company. It approximates 600 feet long and twenty feet high and is composed of ninety-eight steel-framed panels. Subjects are scenes around the company's plant, made from negatives 4x5 or 8x10 inches in size. Nearly one mile of photographic paper, forty inches wide, was required, together with 12,000 feet of plywood

for backing, 200 gallons of paste, half a mile of chromium metal moulding and other materials in proportion. The big picture now hangs permanently in the Ford "Courtesy Building" at Dearborn.

Photomurals are now employed for wall decoration and other purposes in an infinite number of situations. Some twenty distinct types have been created, ranging from the
[Continued on page 137]



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JULY
NSC

MECHANIX ILLUSTRATED

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4 MAGAZINES
IN ONE

HITLER'S
INVASION
SECRETS!
SEE PAGE 52

WILL
SHARKS ATTACK
BATHERS?

SEE PAGE 35



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JULY 1941

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JULY
1941

Volume XXVI
Number 3

W. H. FAWCETT, JR., President

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DONALD
G. COOLEY

Don Cooley, whose article, "You're Wanted—For A Defense Job!" appears on page 40, will be remembered by readers of MECHANIX ILLUSTRATED for his highly authentic and informative series of articles on "Your Job," which appeared last year. Don

started his career writing detective and adventure stories, and then found a happy outlet for a lifelong interest in science when MECHANIX ILLUSTRATED (then MODERN MECHANIX) was being organized. After five years at the editorial helm, he became curious to know if several South Sea novelettes he had written were authentic as to background, so he spent a summer in Tahiti and returned to New York to become a free-lance writer. In recent years he has been writing mostly on scientific and medical subjects, since he believes that the most fascinating of today's developments are taking place in those fields.

Fly your own airplane the first time you ever leave the ground!

It sounds incredible. But Maxwell Hamilton, writer for MECHANIX ILLUSTRATED, actually did it!

Mr. Hamilton was one of those rare birds, a man who in this day and age had never been up in an airplane, even as a passenger! He took his first ride just the other day, out at New York's Roosevelt Field. He stepped into an airplane, took over the controls, taxied across the field, and made a perfect takeoff! He flew the plane around for an hour—and then brought it in himself to a satisfactory landing!

There's no catch. It was simply a miraculous new type of airplane which, believe it or not, is spin-proof. Mr. Hamilton tells about it in September MECHANIX ILLUSTRATED.

ROBERT HERTZBERG, Editor

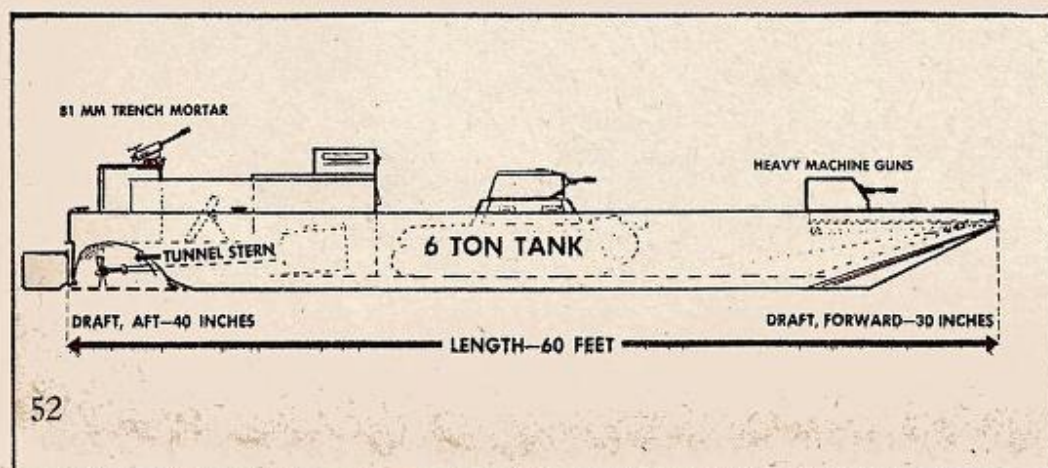
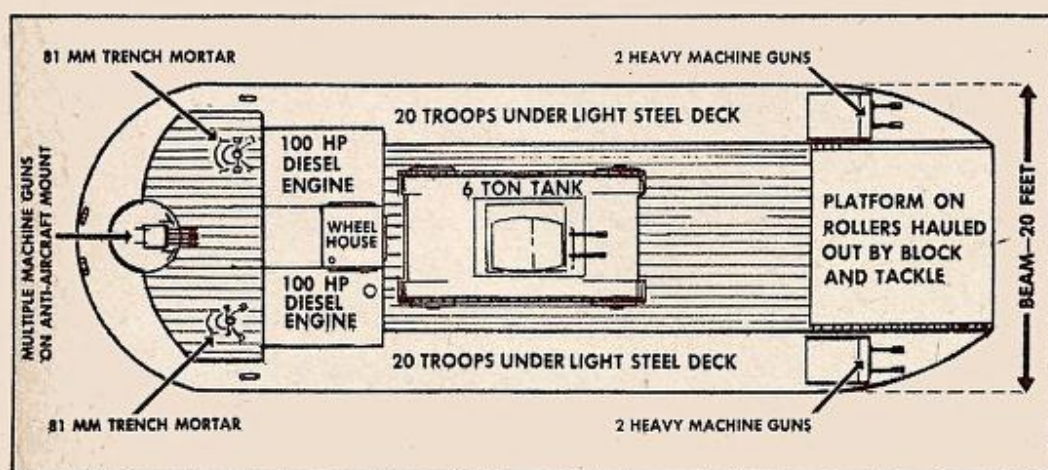
MECHANIX ILLUSTRATED is published monthly by Fawcett Publications, Inc., 1100 W. Broadway, Louisville, Ky. Printed in U. S. A. Advertising and Editorial Offices, Paramount Building, 1501 Broadway, New York, N. Y. General Offices, Fawcett Building, Greenwich, Conn. Elliott D. Odell, Advertising Director; Roscoe K. Fawcett, Circulation Director; Ralph Daigh, Editorial Director; Al Allard, Art Director. Entered as second-class matter at the post office at Louisville, Ky., under the act of March 3, 1879. Additional entry at Greenwich, Conn. Copyright 1941 by Fawcett Publications, Inc. Reprinting in whole or in part forbidden except by permission of the publishers. Title registered in the U. S. Patent Office. Address manuscripts to New York Editorial Offices. Not responsible for lost manuscripts or photos. Unacceptable contributions will be returned, if accompanied by sufficient first class postage. Price 10c per copy. Subscription price \$1.00 per year in U. S. and possessions. Canadian subscriptions not accepted. Foreign subscriptions \$2.00 per year. Foreign subscriptions and sales should be remitted by International Money Order in United States funds payable at Greenwich, Conn. Advertising forms close fifth of second month preceding date of issue.

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Hitler's Invasion Secrets!



The two pictures above show how the proposed invasion barges will appear, fore and aft. The two propellers may be recessed into the hull so they won't scrape the bottom when the barge is run up on the beach. Two propellers are necessary so the barges can be steered by slowing up one and speeding up the other if the rudder should be damaged.



SINCE the fall of France last Spring, the world has been asking itself one question: If and when Hitler attempts to invade England, how will he do it—or try to do it?

Invasion weather is here. If the Nazis intend to make good their threats, they must invade England between now and August or give up the idea. By this time next year, American aid will have helped make England's defenses entirely too formidable for any such invasion attempt.

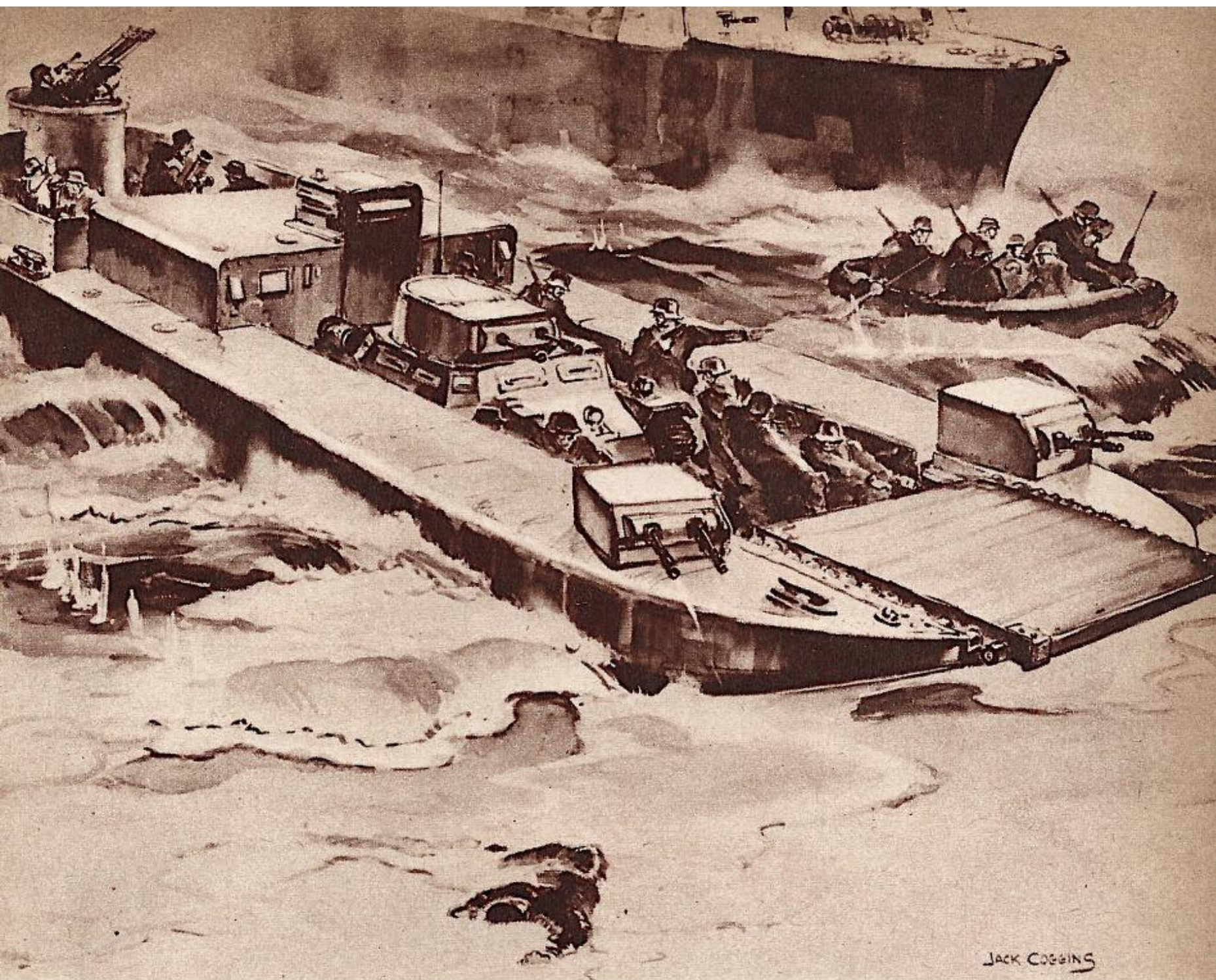
Should the Germans try invasion, they'll probably attempt it at night in fleets of great barges, augmented by shoal-draft freighters, of which Germany has thousands. Destroyers and submarines will guard the invasion fleet across the Channel, and an overhead blanket of fighter planes and bombers will protect them during the crossing and while they are attempting to establish a landing base.

No one knows exactly what the barges will look like, how fast they will travel or how many men and tanks they will carry. Varied naval and military opinion pictures them as resembling everything from speedy sea-sleds to clumsy scows towed by tugs or destroyers.

Jack Coggins, well-known marine artist who has drawn the sketches and diagrams on these pages, bases his drawings on an extensive knowledge of functional ship design, combined with a thorough familiarity with the Channel

The two diagrams at the left give an overhead and profile view of the invasion barges. Note the very simple construction.

Mechanix Illustrated



Here is the actual invasion, as envisioned by Jack Coggins. The troops landing in the rubber boat are from the Rhine River freighter in the background. The whole invasion would be covered by an overhead blanket of Nazi planes.

Coast of England. Before making these drawings, he imagined himself in Hitler's place. If he were going to invade England, he thought, he'd have to be able to transport and land wave after wave of troops. On his ability to do this the success of an invasion would depend.

He realized that he would have to transport these troops across the Channel in boats that could be run up on a beach. Unloading men on small boats from freighters, cruisers or destroyers would take too long. He realized, also, that the troops would have to be preceded by tanks, and that he would have to land light artillery and machine guns on the beach to back up the landing forces.

Hundreds of barges would be needed for such an invasion, which means that they must be simply and cheaply made. They must be shallow-bottomed so they can be easily beached, and they must have room for at least one light tank, with some sort of runway up forward to roll it onto the shore.

To avoid the dangers of wallowing helplessly if their towing ships were crippled, the barges would be self-propelled. They would be sufficiently armed to defend themselves against fighter planes and bombers, but not armed heavily enough to slow them down too much.

Taking all these things into consideration, Jack Coggins designed the invasion barge which appears on these pages. It is 60 feet long, 20 feet wide and made of light steel. It is flat-bottomed and very shallow, drawing 40 inches of water aft and 30 inches forward. It displaces around 85 tons. The invasion barge wouldn't be any bigger than this, Coggins reasons, because any larger ship would be less maneuverable, less likely to slip through the coastal defense traps that will be awaiting it.

The forward two-thirds of the barge is a hollow shell. Steel shelves curve inward to make protective side decks under which

[Continued on page 142]